

Application No. 09/844,251
Filed: April 27, 2001
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REMARKS

In the most recent Office Action, claims 1-15 were pending. Claims 6-11 are withdrawn from consideration. Claims 1-5 and 12-15 stand rejected.

In response, claims 1-5 and 12-15 are amended. New claims 16-20 are added. No new matter is added.

Election/Restriction

Applicant acknowledges the timely traversed restriction with election of claims 1-5 and 12-15 for further prosecution. Applicant further acknowledges that claims 1-5 are generic, and claims 6-11 are drawn to a non-elected species. Applicants respectfully requests claims 6-11 remain in the application pending allowance of a generic claim.

Claim Rejections - 35 U.S.C. § 102

The Office Action states that claims 1-3 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lutz et al. (U.S. Patent No. 4,617,542). In particular, the Office Action states that Lutz et al. disclose a process for preparing contacts on a microswitch that discloses each and every limitation recited in claims 1-3. The rejection is respectfully traversed.

The disclosure by Lutz et al. appears to focus on the fluid in which a switch is immersed during operation to obtain various

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advantages. The fluid is not used for preparation of switch contacts. Indeed, the disclosure by Lutz et al. appears to discuss the preparation of the contacts simply by cleaning them in alcohol and applying a small drop of mercury (column 5, lines 3-14). The disclosure by Lutz et al. is completely silent with respect to any impact on resistance related to the microswitch contacts. More importantly, however, the disclosure by Lutz et al. is not directed to a microswitch. For example, Lutz et al. discuss processing the switch by tapping the frame on a clean piece of filter paper (column 5, line 8), and providing at least 0.075 inches of clearance between a container and any exposed conductors in the switch (column 5, lines 35-38). These characteristics and other description clearly identify the switch by Lutz et al. as a high voltage mechanical switch, rather than a microswitch. In contrast, the present invention provides microswitches that are fabricated using integrated circuit processing techniques to produce true surface micromachined structures. For example, the structures of the microswitches prepared according to the present invention are typically on the order of microns and may be produced to interact with active semiconductor elements. Accordingly, the disclosure by Lutz et al. does not anticipate these microswitch structures and does not

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teach the elements recited in claims 1-3. For all of the above reasons, Applicant respectfully requests that the rejection of claims 1-3 under 35 U.S.C. § 102(b) be reconsidered and withdrawn.

Claim Rejections - 35 U.S.C. § 103

The Office Action states that claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lutz et al. in view of Kasai et al. (U.S. Patent No. 6,483,395). In particular, the Office Action states that the disclosure by Kasai et al. teaches the use of ruthenium contacts in an obvious combination with the disclosure by Lutz et al. The rejection is respectfully traversed.

Applicant first notes that the disclosure by Lutz et al. fails to teach or suggest temporarily exposing a microswitch contact to a fluid under predetermined conditions to lower a contact resistance, as is recited in claim 4 and discussed above with regard to the rejection under 35 U.S.C. § 102(b). Similarly, the disclosure by Kasai et al. fails to teach or suggest this element recited in claim 4. Accordingly, because the disclosures by Lutz et al. and Kasai et al. fail to teach or suggest an element recited in claim 4, a *prima facie* case of obviousness is not established against claim 4. MPEP § 2143.03.

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In addition, Applicant submits that it would not be obvious to combine the disclosures by Lutz et al. and Kasai et al. to arrive at the invention recited in claim 4. As noted above, the disclosure by Lutz et al. is not directed to a microswitch. Accordingly, even if the contacts of the switch disclosed by Lutz et al. were coated with ruthenium, as suggested in the Office Action, the invention recited in claim 4 would still not result. In addition, any suggestion or motivation to combine the references is lacking in the references themselves due to the different nature of the switches that are disclosed in Lutz et al. and Kasai et al. Accordingly, Applicant respectfully submits that the rejection of claim 4 under 35 U.S.C. § 103(a) is overcome, and respectfully requests that it be reconsidered and withdrawn.

The Office Action states that claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lutz et al. in view of Ma et al. (U.S. Patent No. 6,483,395). In particular, the Office Action states that Lutz et al. discloses the process of claim 1 with the exception of the process outlined in Figure 3, which is supplied by Ma et al. in an obvious combination. The rejection is respectfully traversed.

As noted above, Applicant respectfully submits that Lutz et al. do not teach or suggest a microswitch with contacts prepared

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through temporary exposure to a fluid under predetermined conditions to lower a contact resistance. The disclosure by Lutz et al. similarly fails to teach or suggest the construction of a microswitch in accordance with the process outlined in Figure 3. As discussed above, Lutz et al. appear to teach the construction of a large scale switch capable of switching high voltages in a particularly specified fluid environment. The microswitch according to the present invention recited in claim 5 has dimensions on a micron level and is fabricated using standard IC processing techniques. Accordingly, the disclosure by Lutz et al. fails to teach or suggest a number of elements recited in claim 5 according to the present invention.

The disclosure by Ma et al. also fails to teach or suggest the invention recited in claim 5. A review of the disclosure by Ma et al., particularly Figure 5, appears to show the construction of a microswitch on a number of pads composed of a dielectric material (column 6, lines 11-15). In contrast, the present invention recited in claim 5 calls for the deposition of gate, source, and drain electrodes that can be electrically conductive. The dielectric pads apparently taught by Ma et al. are not electrically conductive.

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Accordingly, Applicant respectfully submits that the invention recited in claim 5 of the present invention includes a number of elements that are not taught by Lutz et al. or Ma et al., either alone or in combination. Because the cited prior art references of Lutz et al. and Ma et al. do not teach or suggest all of the claim limitations, Applicant respectfully submits that a *prima facie* case of obviousness is not established against claim 5.

In addition, Applicant respectfully submits that it would not be obvious to one of ordinary skill in the art to combine the disclosures by Lutz et al. and Ma et al. to arrive at the present invention recited in claim 5. There is no teaching or suggestion whatsoever in the disclosure by Lutz et al. that a microswitch may be formed in accordance with the tenets of the cited disclosure. In addition, Ma et al. fail to teach or suggest a conductive source, gate and drain as recited in claim 5 of the present invention. Accordingly, one of ordinary skill in the art would not look to the disclosures by Lutz et al. or Ma et al. to obtain a combination of teachings, or modification of the teachings, or suggestions in those references to arrive at the invention recited in claim 5. The disclosures by Lutz et al. and Ma et al. do not include any suggestion or motivation for their combination or the

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modification of one with another, since Lutz et al. do not teach or suggest a microswitch and Ma et al. fails to teach or suggest a high voltage switch such as that disclosed by Lutz et al. formed according to IC processing techniques.

Applicant further submits that claim 5 depends upon and further limits claim 1, and includes all the limitations of claim 1, and should be allowable for the same reasons. In view of the above discussion, Applicant respectfully submits that the rejection of claim 5 under 35 U.S.C. § 103(a) is overcome, and respectfully requests that it be reconsidered and withdrawn.

The Office Action states that claims 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lutz et al. in view of Youngner et al. (U.S. Patent No. 5,959,338). In particular, the Office Action states that while the disclosure by Lutz et al. does not teach the use of argon to prepare a contact, the same is disclosed by Youngner et al. in an obvious combination. The rejection is respectfully traversed.

As noted previously, the disclosure by Lutz et al. fails to teach or suggest a number of elements recited in claim 12, since the disclosure by Lutz et al. appears to be directed to a fluid component of a high voltage switch, while the present invention reciting claim 12 is for a microswitch with a particular method

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for preparing the microswitch contacts. In addition, the disclosure by Youngner et al. fails to teach or suggest the preparation of contacts in any type of switch, instead noting that a diaphragm-type switch may be formed with an inert gas such as argon between the diaphragms. The disclosure by Youngner et al. completely lacks any discussion or teaching regarding the formation of contacts in a microswitch, as is recited in claims 12-14 of the present invention. Accordingly, because claims 12-14 recite elements that are not taught or suggested by Lutz et al. or Youngner et al., either alone or in combination, a *prima facie* case of obviousness has not been established against those claims.

In addition, Applicant respectfully submits that one of ordinary skill in the art would not be taught or motivated to combine the disclosures by Lutz et al. and Youngner et al., or to modify their content to arrive at the present invention recited in claims 12-14. The device disclosed by Youngner et al. appears to be a diaphragm-type microswitch, while Lutz et al. discloses a fluid for use with a high voltage mechanical or electromechanical switch. One of ordinary skill in the art would not seek to combine these references due to the very different nature of their structure and operation, and because there is no teaching or suggestion in either of the references that they can or should be

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combined. In addition, even if the references by Lutz et al. and Youngner et al. could be combined, any resulting device would still leave one of ordinary skill in the art at a loss as to how to arrive at the invention recited in claims 12-14.

Claims 12-14 ultimately depend upon and further limit claim 1, which is believed to be allowable over the cited prior art references as discussed above, and claims 12-14 are believed to be allowable for the same reasons as claim 1. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established against claims 12-14 based on the disclosures by Lutz et al. in view of Youngner et al., either alone or in combination, and respectfully request that the rejection of those claims under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

The Office Action also states that the disclosures by Lutz et al. in view of Youngner et al. discloses the claimed invention in claims 13 and 14 except for the specific material used. The Office Action goes on to state that it would have been obvious to one of ordinary skill in the art to alter the material used to obtain a desirable contact resistance. Applicant strongly contests this observation with regard to the present invention or the cited prior art references and avers that the recitation of the present invention in claims 13 and 14 are not obvious over the

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cited prior art references of Lutz et al. in view of Youngner et al., either alone or in combination, or over knowledge generally available to one of ordinary skill in the art. Applicant has specifically pointed out the use of the inventive process described in the present application to lower contact resistance. This result is neither obvious nor apparent to one of ordinary skill in the art. The Examiner has provided no evidence of obviousness with respect to selection of material, as the cited prior art references are completely silent in that regard. A *prima facie* case of obviousness may not be established where there is no evidence to support such a conclusion. MPEP § 2142.

The Office Action states that claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kasai et al. (U.S. Patent No. 6,483,395). In particular, the Office Action states that Kasai et al. teach all of the elements of claim 15 with the exception of exposure to an oxygen plasma, the same being considered to be obvious to one of ordinary skill in the art at the time the invention was made. The rejection is respectfully traversed.

All of the cited prior art references in the Office Action, including the disclosure by Kasai et al., lack any teaching or suggestion on the use of an oxygen plasma for treating the

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contacts of a microswitch to reduce contact resistance. "With regard rejections under 35 U.S.C. § 103, the Examiner **must provide evidence** which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a prima facie case of obviousness) is more probable than not." (Emphasis added.) In the rejection of claim 15, the Examiner merely states that:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to exposing [sic] the contacts to oxygen plasma since it was known in the art that oxygen plasma is a common etching process.

This is merely the legal determination sought to be proved. Accordingly, the Examiner has not provided evidence of obviousness as is required for supporting a *prima facie* case of obviousness.

Applicant respectfully submits that a *prima facie* case of obviousness has not been established against claim 15. Applicant therefore respectfully requests that the rejection of claim 15 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Conclusion

Applicant respectfully believes that the present response addresses all issues raised in the most recent Office Action. In view of the above amendments and discussion, Applicant

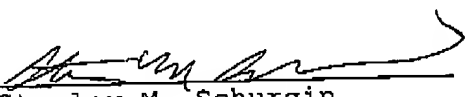
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respectfully submits that the application is now in condition for allowance, and earnestly solicits notice to that effect.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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